

**What is claimed is:**

1        1. A method of task classification using morphemes which operates  
2 on the task objective of a user, the morphemes being generated by clustering  
3 selected ones of salient sub-morphemes from training speech which are  
4 semantically and syntactically similar, comprising:

5                 detecting morphemes present in the user's input communication;  
6 and

7                 making task-type classification decisions based on the detected  
8 morphemes in the user's input communication.

1        2. The automated task classification method of claim 1, wherein the  
2 morphemes include at least one of verbal speech and non-verbal speech.

1        3. The automated task classification method of claim 2, wherein the  
2 non-verbal speech includes the use of at least one of gestures, body movements,  
3 head movements, non-responses, text, keyboard entries, keypad entries, mouse  
4 clicks, DTMF codes, pointers, stylus, cable set-top box entries, graphical user  
5 interface entries and touchscreen entries.

1        4. The automated task classification method of claim 1, wherein the  
2 morphemes are expressed in multimodal form.

1        5. The automated task classification method of claim 1, wherein the  
2 user's input communication is derived from the verbal and non-verbal speech  
3 and the user's environment.

1        6. The automated task classification method of claim 1, wherein the  
2 morphemes in the user's input communication are derived from the user's  
3 actions, including the user's focus of attention.

1        7. The automated task classification method of claim 1, further  
2 comprising entering into a dialog with the user to obtain a feedback response  
3 from the user.

1        8. The automated task classification method of claim 7, wherein the  
2 user is prompted to provide a feedback response includes additional information  
3 with respect to the user's initial input communication.

1       9. The automated task classification method of claim 7, wherein the  
2 user is prompted to provide a feedback response that includes confirmation with  
3 respect to at least one of the set of task objectives determined in the  
4 classification decision.

1       10. The automated task classification method of claim 1, wherein the  
2 input communication is routed based on the classification decision.

1       11. The automated task classification method of claim 10, wherein the  
2 task objective is performed after the input communication is routed.

1       12. The automated task classification method of claim 1, wherein the  
2 method operates in conjunction with one or more communication networks, the  
3 communication networks including a telephone network, the Internet, an intranet,  
4 Cable TV network, a local area network (LAN), and a wireless communication  
5 network.

1       13. The automated task classification method of claim 1, wherein the  
2 method is used for customer care purposes.

1       14. The automated task classification method of claim 1, wherein the  
2 classification decisions and corresponding user input communications are  
3 collected for automated learning purposes.

1       15. The automated task classification method of claim 1, wherein the  
2 relationship between the generated morphemes and the predetermined set of  
3 task objectives includes a measure of usefulness of a one of the morphemes to a  
4 specified one of the predetermined task objectives.

1       16. The automated task classification method of claim 15, wherein the  
2 usefulness measure is a salience measure.

1       17. The automated task classification method of claim 16, wherein the  
2 salience measure is represented as a conditional probability of the task objective  
3 being requested given an appearance of the morpheme in the input  
4 communication, the conditional probability being a highest value in a distribution  
5 of the conditional probabilities over the set of predetermined task objectives.

1        18. The automated task classification method of claim 16, wherein  
2 each of the plurality of generated morphemes has a salience measure exceeding  
3 a predetermined threshold.

1        19. The automated task classification method of claim 1, wherein the  
2 relationship between the generated morphemes and the predetermined set of  
3 task objectives includes a measure of commonality within a language of the  
4 morphemes.

1        20. The automated task classification method of claim 19, wherein the  
2 commonality measure is a mutual information measure.

1        21. The automated task classification method of claim 20, wherein  
2 each of the plurality of generated morphemes has a mutual information measure  
3 exceeding a predetermined threshold.

1        22. The automated task classification method of claim 11, wherein the  
2 step of making a classification decision includes a confidence function.

1        23. The automated task classification method of claim 11, wherein the  
2 input communication from the user represents a request for at least one of the  
3 set of predetermined task objectives.

1        24. The automated task classification method of claim 11, wherein the  
2 input communication is responsive to a query of a form "How may I help you?".

1        25. The automated task classification method of claim 11, wherein  
2 each of the verbal and non-verbal speech are directed to one of the set of  
3 predetermined task objectives and each of the verbal and non-verbal speech is  
4 labeled with the one task objective to which it is directed.

1        26. A method of task classification which operates on the task objective  
2 of a user, comprising:

3              selecting salient phone-phrases from training speech;  
4              generating acoustic morphemes by clustering selected ones of the  
5 salient phone-phrases which are semantically and syntactically similar;  
6              detecting acoustic morphemes present in the user's input  
7 communication; and

8                   making task-type classification decisions based on the detected  
9    acoustic morphemes in the user's input communication.

1                 27. A method of task classification which operates on the task objective  
2    of a user, comprising:

3                 selecting salient sub-morphemes from training speech;  
4                 generating morphemes by clustering selected ones of the salient  
5    sub-morphemes which are semantically and syntactically similar;

6                 detecting morphemes present in the user's input communication;  
7    and

8                 making task-type classification decisions based on the detected  
9    morphemes in the user's input communication.

1                 28. A method of task classification using acoustic morphemes which  
2    operates on the task objective of a user, the acoustic morphemes being  
3    generated by clustering selected ones of salient phone-phrases from training  
4    speech which are semantically and syntactically similar, comprising:

5                 detecting acoustic morphemes present in the user's input  
6    communication; and

7                 making task-type classification decisions based on the detected  
8    acoustic morphemes in the user's input communication.